

### Abstract of Disclosure

A heat pump and air conditioning system for a vehicle that has at least one coolant loop selectively connecting an engine cooling system with a heater core, a  
5 first coolant/refrigerant heat exchanger, and/or a second coolant/refrigerant heat exchanger, in order to warm a passenger compartment of the vehicle. The system also includes a refrigerant loop that includes a first expansion device between a condenser and evaporator, and a second expansion device between the first coolant/refrigerant heat exchanger and the second coolant/refrigerant heat exchanger.  
10 The refrigerant loop provides for cooling of the passenger compartment of the vehicle, as well as operating as a heat pump, together with the at least one coolant loop, to provide heat to the vehicle passenger compartment.